

Fact Sheet  
23 June 2003  
Amended 6 February 2004

City of Hobart Wastewater Treatment Plant  
37<sup>th</sup> Avenue and Deep River  
Hobart, Indiana

NPDES Permit No. IN0061344

BACKGROUND

The applicant proposes to construct a wastewater treatment plant that is a Class IV, 4.8 million gallon per day (MGD) facility with two equalization basins, microscreening and grit removal, dual oxidation ditches operated in conjunction with membrane filtration, chemical addition for pH and phosphorus control and ultraviolet light disinfection followed by effluent reaeration.

The preliminary design work for the proposed facility will include computer modeling and operation of a pilot plant to verify performance. The computer model is structured to prepare a mathematical model based on the proposed membrane bioreactor. This activity will investigate the evaluation of steady and unsteady state conditions on the treatment plant for evaluation of optimum design. This will include the number and size of reactors, mixed liquor suspended solids concentrations, operation range for solids residence time, required reaeration ranges, and alum feed.

The preliminary design work will be followed by the construction of a pilot plant at bench scale with an approximate flow rate of 60 ml per minute and a more full scale on-site unit at an anticipated flow rate of 20 gallons per minute to verify the modeling results.

The bench scale unit has been in operation since November 24, 2003 and according to the consulting engineers for the City of Hobart, has demonstrated the ability of the treatment process to meet both ammonia-nitrogen and mercury limits contained within the draft NPDES permit. The on-site unit will be used to demonstrate the membrane system with wastewater generated by the City of Hobart.

RECEIVING STREAM

Discharge is through one Outfall (001) to Deep River. The  $Q_{7,10}$  low flow of Deep River is 5.8 cfs. Deep River is designated for full body contact recreation and is to be capable of supporting a well-balanced, warm water aquatic community. In addition, Deep River is considered a high quality water for ammonia-N, copper and dissolved oxygen. Deep River eventually enters Lake Michigan via Burns Ditch and Burns Waterway. The Indiana portion of the open waters of Lake Michigan is designated in 327 IAC 2-1.5-19(b)(2) as an outstanding state resource water (OSRW). Discharges to tributaries of OSRWs are subject to the antidegradation implementation procedure for OSRWs in 327 IAC 5-2-11.7.

## INDUSTRIAL CONTRIBUTORS

There are no significant industrial contributors indicated on the application to the proposed City of Hobart treatment plant. This NPDES permit does not authorize the facility to accept industrial contributions until the permittee has provided the Indiana Department of Environmental Management with a characterization of the waste, including volume amounts, and this Office has determined whether effluent limitations are needed to ensure the state water quality standards are met in the receiving stream.

The effluent characterization conducted as part of the application requirements was performed on untreated sewage with estimated removal percentages. Although the applicant does not accept or plan to accept significant amounts of industrial waste either directly at the treatment plant or through the collection system to the treatment plant, organic pollutant monitoring has been added to the permit to verify annually that the influent character of the wastewater has not changed. This requirement coupled with whole effluent toxicity testing is expected to provide an additional safeguard of the receiving waters.

## ANTIDegradation REVIEW

Antidegradation review under 327 IAC 5-2-11.3:

The Deep River is a high quality water under 327 IAC 2-1.5-4(b) for ammonia-nitrogen, dissolved oxygen and copper because the existing water quality for the river exceeds, (that is, it is better than) the water quality criteria for those pollutants. Therefore, the antidegradation implementation procedures for high quality waters at 327 IAC 5-2-11.3(b) were considered for these parameters. An assessment of the available data submitted by the City of Hobart shows the Deep River is not a high quality water for mercury since the concentration of mercury in the Deep River is greater than the wildlife criterion of 1.3 ng/l, thus, the procedures set forth in 327 IAC 5-2-11.3(b) were not applied to mercury. However, effluent limits for mercury that apply end-of-pipe have been incorporated to protect existing and designated uses pursuant to 327 IAC 5-2-11.3(a).

As part of its antidegradation evaluation for high quality waters, IDEM determined whether the proposed effluent limits for the above-mentioned parameters (with the exception of mercury) would result in a significant lowering of water quality. The City of Hobart was provided with two possible sets of effluent limits for those parameters. The first set of limits were based on standard procedures set forth in 327 IAC 5 for establishing water quality-based effluent limits; these limits would have resulted in a significant lowering of water quality under 327 IAC 5-2-11.3(b)(1)(B) and would have required Hobart to submit an antidegradation demonstration for approval by the department. The second set were based on not causing a significant lowering of water quality as defined in 327 IAC 5-2-11.3(b)(1)(B), for ammonia-nitrogen, dissolved oxygen and copper.

The City of Hobart accepted the second set of effluent limits that did not result in a significant lowering of water quality; thus, the City of Hobart did not have to submit an

antidegradation demonstration for ammonia-nitrogen, dissolved oxygen and copper.

Antidegradation Review under 327 IAC 5-2-11.7:

Because Deep River discharges into Lake Michigan via Burns Ditch and Burns Waterway, Deep River is considered a tributary of an outstanding state resource water (OSRW) and thence subject to the antidegradation implementation procedures as set out in 327 IAC 5-2-11.7. For a new or increased discharge of a pollutant or pollutant parameter from a new or existing Great Lakes discharger into a tributary of an OSRW for which a new or increased permit limit would be required, the requirements of 327 IAC 5-2-11.3(a) and 11.3(b) apply to the new or increased discharge into the tributary and the discharge shall not cause a significant lowering of water quality in the OSRW (327 IAC 5-2-11.7(a)(2)(A) and 11.7(a)(2)(B)). As explained earlier in this Fact Sheet, the discharge meets the requirements of 327 IAC 5-2-11.3(a) and 11.3(b). The determination of whether the discharge will cause a significant lowering of water quality in the OSRW was made in accordance with IDEM nonrule policy document Water-002-NRD. According to the nonrule policy document, a new or increased discharge into a tributary of Lake Michigan will not cause a significant lowering of water quality in Lake Michigan if any of the following are met:

- (1) The new or increased discharge into a tributary of Lake Michigan is the result of an activity that will result in a significant overall environmental benefit to Lake Michigan.
- (2) The new or increased discharge into a tributary of Lake Michigan does not cause a significant lowering of water quality in the tributary, as determined under 327 IAC 5-2-11.3(b)(1)(A) or 327 IAC 5-2-11.3(b)(1)(B).
- (3) For non-bioaccumulative chemicals of concern, the new or increased discharge into a tributary of Lake Michigan uses less than 10% of the unused loading capacity of Lake Michigan.

For all of the pollutants for which there is a new permit limit, except mercury, the new discharge does not cause a significant lowering of water quality in the tributary as determined under 327 IAC 5-2-11.3(b)(1)(B). Therefore, condition (2) is met and the new discharge will not cause a significant lowering of water quality in Lake Michigan for these pollutants.

For mercury, which is a BCC, the new discharge will cause a significant lowering of water quality in the tributary as determined under 327 IAC 5-2-11.3(b)(1)(A). However, IDEM has determined that the new discharge of mercury into the tributary of Lake Michigan is the result of an activity that will result in a significant overall environmental benefit to Lake Michigan. Therefore, condition (1) is met and the new discharge will not cause a significant lowering of water quality in Lake Michigan for mercury. This determination is based in part on the fact that Hobart currently discharges into the Gary Sanitary District's combined sewer system, and there are up to nine (9) CSO outfalls that Hobart's wastewater may discharge through before its

wastewater reaches the Gary POTW and is treated. These outfalls are located on the Grand Calumet River and the Little Calumet River, which are both tributaries to Lake Michigan. While an exact quantification of the volume and pollutant loadings attributable to Hobart's flow that may discharge through these CSO outfalls is difficult, at least some of Hobart's flow will be discharged through Gary's CSO outfalls. The pollutants or parameters being discharged through the CSO outfalls without treatment include *E. coli*, mercury, CBOD<sub>5</sub>, ammonia-nitrogen and copper. The Gary Sanitary District will be required to develop and implement a long term control plan (LTCP) that ensures that its CSO discharges comply with water quality standards. However, it will be years before Gary has taken the necessary steps to have done so. In comparison, all of Hobart's wastewater will immediately receive the treatment necessary to comply with water quality standards. Therefore, the proposed new plant will result in a significant overall environmental benefit to Lake Michigan.

Additionally, more stringent effluent limitations would be applicable to the proposed new treatment plant for mercury, ammonia-nitrogen and copper than are applicable to the Gary POTW. IDEM compared the effluent limitations for the proposed new plant for these pollutants with the limitations established for the Gary Sanitary District. In this comparison, a design flow of 4.7 MGD was utilized. This figure is based on the anticipated design flow of the proposed Hobart treatment plant of 4.8 MGD minus the average design flow of the Nob Hill treatment plant (0.1 MGD) which is also owned by the City of Hobart and which currently discharges to Spring Creek. The resultant value would be the maximum possible dry weather flow which could be discharged to the Gary SD under optimum operating conditions. Daily maximum permit limitations were examined for both the Gary SD and the proposed Hobart treatment plant and the loadings in pounds per day were calculated for each of the three pollutants. As the last renewal of the Gary SD NPDES permit preceded the requirement for a daily maximum ammonia-nitrogen limit, the daily maximum values utilized were obtained from the 1992 wasteload allocation for the Grand Calumet River and Indiana Harbor Ship Canal. All other parameters were expressed as a daily maximum limit in the respective NPDES permits. The proposed Hobart wastewater treatment plant has the potential to discharge 11,798 pounds per day of these parameters. The Gary SD treatment plant, in meeting its discharge limitations, would discharge 345,987 pounds per day for these three parameters. This gives a ratio of 29.325:1. Thus the Gary SD would discharge these pollutant parameters at a rate of 29 times that of the proposed Hobart wastewater treatment plant.

### TOXICITY TESTING

The Indiana Water Quality Standards require that a discharge not cause acute toxicity, as measured by whole effluent toxicity tests, at any point in the waterbody (327 IAC 2-1.5-8(b)(1)(E)(ii)) and that a discharge not cause chronic toxicity, as measured by whole effluent toxicity tests, outside of the applicable mixing zone (327 IAC 2-1.5-8(b)(2)(A)(iv)). The monitoring required for the whole effluent toxicity should indicate whether there are toxicity-causing pollutants in the effluent. 327 IAC 5-2-3(g) and 40 CFR 122.21(j) require that all POTW's (Publicly Owned Treatment Works) with design influent flows equal to or greater than

one million gallons per day and those, regardless of size, with approved pretreatment programs, or those required to develop a pretreatment program, must provide the results of valid whole effluent biological toxicity tests.

Since the City of Hobart cannot, in a practical manner, fully characterize its effluent until the physical treatment works has been constructed, the chronic toxicity tests specified shall be conducted monthly for a period of three months and, provided no toxicity is shown, once every year thereafter for the duration of the permit.

If toxicity is found after the three-month period, testing must revert to the monthly monitoring schedule with two or more species. After three monthly tests have been completed, the permittee may reduce the number of species tested to only include the species demonstrated to be most sensitive to the toxicity in the effluent. The first test shall be conducted within 180 days of the effective startup date of the planned treatment plant. Compliance with the requirement for chronic toxicity is demonstrated if the waterbody does not exceed 1.0 TU<sub>c</sub> at the edge of the mixing zone (327 IAC 2-1.5-8(b)(2)(A)(iv)). To ensure that this requirement is met, a wasteload allocation for chronic whole effluent toxicity was calculated using the procedure in 327 IAC 5-2-11.4(c). The resulting wasteload allocation for chronic whole effluent toxicity is 1.2 TU<sub>c</sub>. Chronic toxicity will be demonstrated if the discharge exceeds the wasteload allocation for chronic whole effluent toxicity.

### COLLECTION SYSTEM

The collection system of the City of Hobart wastewater treatment plant is 100% sanitary sewers by design. The use of the one existing sanitary sewer overflow which is located at the main lift station to the Gary collection system will be discontinued after completion of the proposed wastewater treatment plant.

### SOLIDS DISPOSAL

The City of Hobart will be required to dispose of their sludge in accordance with 329 IAC 10, 327 IAC 6.1, or 40 CFR Part 503. The City of Hobart does not plan to landfill any sludge nor apply the sludge on the treatment plant site proper. Instead they intend to produce a Class A sludge which will allow for land application. Class A sludge production requires strict adherence with pathogen reduction, vector attraction reduction and allowable metal concentrations in order to avoid adverse environmental impact.

### EFFLUENT LIMITATIONS AND RATIONALE

The effluent parameters to be limited and/or monitored include: flow, CBOD<sub>5</sub>, TSS, ammonia-nitrogen, pH, dissolved oxygen, *E. coli*, copper, total residual chlorine (TRC) and mercury. The effluent limits, excluding TRC, are based on wasteload allocations performed by

modeling staff on July 12, 2002 and May 20, 2003. The following effluent limitations represent those which would not cause a significant lowering of water quality in Deep River. With the City of Hobart's acceptance of these limits the City is not required to submit an antidegradation demonstration. The proposed effluent limitations contained in this permit comport to the antidegradation requirements of 327 IAC 5-2-11.3 and 327 IAC 5-2-11.7.

The summer monitoring period runs from May 1 through November 30 of each year, the winter monitoring period runs from December 1 through April 30 of each year. The disinfection season runs from April 1 through October 31 annually.

#### Flow

Flow is to be measured daily as a 24-hour total. Reporting of flow is required by 327 IAC 2-4-1.

#### CBOD<sub>5</sub>

CBOD<sub>5</sub> is limited to 5 mg/l as a monthly average and 7.5 mg/l as a weekly average on a year-round basis. Monitoring is to be conducted daily by 24-hour composite sampling.

#### TSS

TSS is limited to 10 mg/l as a monthly average and 15 mg/l as a weekly average on a year-round basis. Monitoring is to be conducted daily by 24-hour composite sampling.

#### AMMONIA-NITROGEN

Ammonia-nitrogen is limited to 0.20 mg/l as a monthly average and 0.45 mg/l as a daily maximum on a year-round basis. Monitoring is to be conducted daily by 24-hour composite sampling.

#### pH

The pH limitations are based on 40 CFR 133.102 which is cross-referenced in 327 IAC 2-1.5-8(c)(2). To ensure conditions necessary for the maintenance of a well-balanced aquatic community, the pH of the final effluent must be between 6.0 and 9.0 standard units. The pH must be measured daily by grab sampling.

#### DISSOLVED OXYGEN

The dissolved oxygen content of the final effluent must be 7.0 mg/l as a daily minimum on a year-round basis. Monitoring is to be conducted daily by grab sampling. The reported daily average concentration of dissolved oxygen in the effluent shall be the arithmetic mean determined by summation of the six daily grab sample results and dividing this sum by six.

These samples are to be collected over equal time intervals during the period of operator attendance.

### Bacteriological Requirements

*E. coli* shall be monitored and reported during the disinfection/recreation season of April 1 through October 31, annually. During this season, *E. coli* shall not exceed 125/100 ml as a monthly average calculated as a geometric mean based on daily samples over a thirty (30) day period and 235/100 ml as a daily maximum in any one (1) sample in a thirty (30) day period. The bacteriological standards are incorporated from 327 IAC 2-1.5-8(e)(2).

### PHOSPHORUS

In accordance with 327 IAC 5-10-2(a)(1)(B)(i), phosphorus removal is required since the treatment works is located within the Lake Michigan drainage basin. Phosphorus removal facilities shall achieve a degree of reduction, as prescribed below, in total phosphorus content of the monthly average wastewater, or produce an effluent containing no more than 1.0 mg/l total phosphorus (P), whichever is more stringent.

<u>Phosphorus (P) Level in Raw Sewage (mg/l)</u>	<u>Required Removal (%)</u>
greater than or equal to 4	80%
less than 4, greater than or equal to 3	75%
less than 3, greater than or equal to 2	70%
less than 2, greater than or equal to 1	65%
less than 1	60%

Phosphorus is to be monitored daily by 24-hour composite sample.

### MERCURY

Mercury limits have been included in the NPDES permit based upon a determination that there is reasonable potential to exceed the water quality criterion for this parameter. Mercury is proposed to be limited to 0.0000013 mg/l (1.3 ng/l) as a monthly average and 0.0000032 mg/l (3.2 ng/l) as a daily maximum.

Mercury sampling of both the influent and effluent of the WWTP shall be conducted bi-monthly (every other month) for the term of the permit using EPA test method 1631, Revision E. This may be achieved by either installing appropriate analytical facilities or by obtaining the services of a commercial laboratory.

### COPPER

Copper limits have been included in the NPDES permit based upon a determination that there

is reasonable potential to exceed the water quality criterion for this parameter. It is proposed to limit copper to 0.0025 mg/l as a monthly average and 0.0052 mg/l as a daily maximum.

### ADDITIONAL GREAT LAKES BASIN DISCHARGER REQUIREMENTS

#### Future Significant Lowering of Water Quality:

As the applicant proposes to discharge into a water body which is located in the Great Lakes basin, it is subject to the water quality standards which are specific to the Great Lakes basin dischargers as found in 327 IAC 2-1.5, 327 IAC 5-1.5 and 327 IAC 5-2. These rules, effective as of February 13, 1997, prohibit any action resulting in a significant lowering of water quality unless an anti-degradation demonstration has been completed by the applicant and approved by the IDEM.

A significant lowering of water quality, in accordance with 327 IAC 5-2-11.3(b)(1), occurs when there is a new or increased loading of a bioaccumulative chemical of concern (BCC) from the permitted facility; or a new or increased permit limit for a non-BCC where the new or increased permit limit results in both a calculated increase in the ambient concentration of a pollutant in the receiving water body, and a lowering of water quality greater than a de minimis lowering of water quality. If the permittee plans to pursue any increase in design flow by plant expansion during the term of this permit, then an antidegradation evaluation would be necessary.

As required by 327 IAC 5-2-11.3(b)(2), the permit (Part II.A.17) specifically prohibits the permittee from taking deliberate actions that would result in new or increased discharges of BCCs or new or increased permit limits for non-BCCs without first proving that the new or increased discharge would not result in a significant lowering of water quality, or by submission and approval of an anti-degradation demonstration to the IDEM.

### MINIMUM NARRATIVE WATER QUALITY STANDARDS

In accordance with 327 IAC 2-1.5-8(b), the discharge from any and all point sources regulated within this permit shall not cause receiving waters, including the mixing zone, to contain substances, materials, floating debris, oil, or scum: that will settle to form putrescent or otherwise objectionable deposits; that are in amounts sufficient to be unsightly or deleterious; that produce color, visible oil sheen, odor, or other conditions in such degree as to create a nuisance; which are in amounts sufficient to be acutely toxic to, or to otherwise severely injure or kill aquatic life, other animals, plants, or humans; and, which are in concentrations or combinations that will cause or contribute to the growth of aquatic plants or algae to such a degree as to create a nuisance, be unsightly, or otherwise impair the designated uses.



BACKSLIDING

None of the limitations included in this permit conflict with the various antibacksliding requirements as specified in 327 IAC 5-2-10(11).

PERMIT TERM

A five-year NPDES permit is proposed.

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